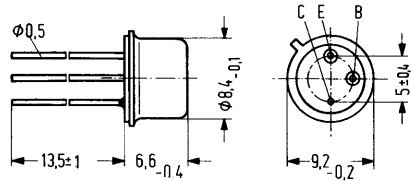


BC 160 and BC 161 are epitaxial PNP silicon transistors in TO 39 case (5 C 3 DIN 41 873). The collector is electrically connected to the case. The transistors are intended for use as complementary transistors to BC 140 and BC 141 and are available upon request as matched pairs.

| Type                 | Ordering code   |
|----------------------|-----------------|
| BC 160 <sup>1)</sup> | Q62702-C228     |
| BC 160-6             | Q62702-C228-V6  |
| BC 160-10            | Q62702-C228-V10 |
| BC 160-16            | Q62702-C228-V16 |
| BC 160 paired        | Q62702-C228-P   |
| BC 160/BC 140 paired | Q62702-C228-S2  |
| BC 161 <sup>1)</sup> | Q62702-C252     |
| BC 161-6             | Q62702-C230     |
| BC 161-10            | Q62702-C231     |
| BC 161-16            | Q62702-C239     |
| BC 161 paired        | Q62702-C230-P   |
| BC 161/BC 141 paired | Q62702-C230-S2  |



Approx. weight 1.5 g      Dimensions in mm

| Maximum ratings           |            | BC 160      | BC 161      |    |
|---------------------------|------------|-------------|-------------|----|
| Collector-base voltage    | $-V_{CBO}$ | 40          | 60          | V  |
| Collector-emitter voltage | $-V_{CEO}$ | 40          | 60          | V  |
| Emitter-base voltage      | $-V_{EBO}$ | 5           | 5           | V  |
| Collector current         | $-I_C$     | 1           | 1           | A  |
| Base current              | $-I_B$     | 0.1         | 0.1         | A  |
| Junction temperature      | $T_j$      | 175         | 175         | °C |
| Storage temperature range | $T_{stg}$  | -55 to +175 | -55 to +175 | °C |
| Total power dissipation   | $P_{tot}$  | 3.7         | 3.7         | W  |

**Thermal resistance**

|                         |            |       |       |     |
|-------------------------|------------|-------|-------|-----|
| Junction to ambient air | $R_{thJA}$ | ≤ 200 | ≤ 200 | K/W |
| Junction to case        | $R_{thJC}$ | ≤ 35  | ≤ 35  | K/W |

**Static characteristics ( $T_{amb} = 25^\circ\text{C}$ )**

The transistors BC 160 and BC 161 are grouped at  $-I_C = 100\text{ mA}$  and  $-V_{CE} = 1\text{ V}$  according to the DC current gain  $h_{FE}$ , and are marked by numerals of the DIN standard series. For the operating points quoted below, the following values apply:

| Type           | BC 160, BC 161        |                       |                       |                |
|----------------|-----------------------|-----------------------|-----------------------|----------------|
| $h_{FE}$ group | 6                     | 10                    | 16                    |                |
| $-I_C$<br>mA   | $h_{FE}$<br>$I_C/I_B$ | $h_{FE}$<br>$I_C/I_B$ | $h_{FE}$<br>$I_C/I_B$ | $-V_{BE}$<br>V |
| 0.1            | 46                    | 80                    | 120                   | -              |
| 100            | 63 (40 to 100)        | 100 (63 to 160)       | 160 (100 to 250)      | -              |
| 1000           | 15                    | 20                    | 30                    | 1.0 (<1.7)     |

1) If the order does not include any exact indication of the current amplification group desired, a transistor of a current amplification group just available from stock will be delivered.

**Static characteristics** ( $T_{amb} = 25^{\circ}\text{C}$ )

Collector cutoff current  
( $-V_{CES} = 40\text{ V}$  or  $60\text{ V}$ )

|            | <b>BC 160</b> | <b>BC 161</b> |    |
|------------|---------------|---------------|----|
| $-I_{CES}$ | 10 (<100)     | 10 (<100)     | nA |

Collector cutoff current  
( $-V_{CES} = 40\text{ V}$  or  $60\text{ V}$ ;  
 $T_{amb} = 150^{\circ}\text{C}$ )

|            |           |           |               |
|------------|-----------|-----------|---------------|
| $-I_{CES}$ | 10 (<100) | 10 (<100) | $\mu\text{A}$ |
|------------|-----------|-----------|---------------|

Collector-emitter breakdown  
voltage ( $-I_{CEO} = 50\text{ mA}$   
pulse width =  $200\ \mu\text{sec}$ ;  
duty cycle 1%)

|                |     |     |   |
|----------------|-----|-----|---|
| $-V_{(BR)CEO}$ | >40 | >60 | V |
|----------------|-----|-----|---|

Collector-emitter breakdown  
voltage ( $-I_{CES} = 100\ \mu\text{A}$ )

|                |     |     |   |
|----------------|-----|-----|---|
| $-V_{(BR)CES}$ | >40 | >60 | V |
|----------------|-----|-----|---|

Emitter-base breakdown  
voltage ( $-I_{EBO} = 100\ \mu\text{A}$ )

|                |    |    |   |
|----------------|----|----|---|
| $-V_{(BR)EBO}$ | >5 | >5 | V |
|----------------|----|----|---|

Collector-emitter saturation  
voltage ( $-I_C = 0.5\text{ A}$ ;  $-I_B = 25\text{ mA}$ )

|                   |            |            |   |
|-------------------|------------|------------|---|
| $-V_{CEsat}^{1)}$ | 0.6 (<1.0) | 0.6 (<1.0) | V |
|-------------------|------------|------------|---|

Conditions for matching pairs:

( $-I_C = 100\text{ mA}$ ;  $-V_{CE} = 1\text{ V}$ )

|                           |             |             |  |
|---------------------------|-------------|-------------|--|
| $\frac{h_{FE1}}{h_{FE2}}$ | $\leq 1.25$ | $\leq 1.25$ |  |
|---------------------------|-------------|-------------|--|

**Dynamic characteristics** ( $T_{amb} = 25^{\circ}\text{C}$ )

Transition frequency ( $-I_C = 50\text{ mA}$ ;  
 $-V_{CE} = 10\text{ V}$ ;  $f = 20\text{ MHz}$ )

|       |     |     |     |
|-------|-----|-----|-----|
| $f_T$ | >50 | >50 | MHz |
|-------|-----|-----|-----|

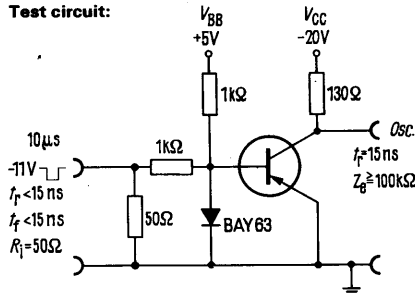
Collector-base capacitance  
( $-V_{CB} = 10\text{ V}$ ;  $f = 1\text{ MHz}$ )

|           |     |     |    |
|-----------|-----|-----|----|
| $C_{CBO}$ | <30 | <30 | pF |
|-----------|-----|-----|----|

Emitter-base capacitance  
( $-V_{EB} = 0.5\text{ V}$ ;  $f = 1\text{ MHz}$ )

|           |      |      |    |
|-----------|------|------|----|
| $C_{EBO}$ | <180 | <180 | pf |
|-----------|------|------|----|

**Test circuit:**



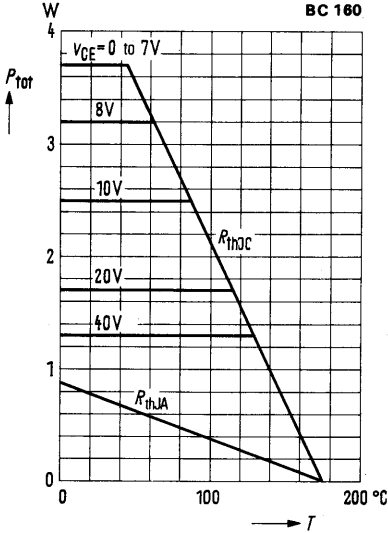
**Switching times for transistors**  
**BC 160, BC 161:**

( $-I_C = 100\text{ mA}$ ;  $I_{B1}$  approx.  $-I_{B2}$  approx.  $5\text{ mA}$ )

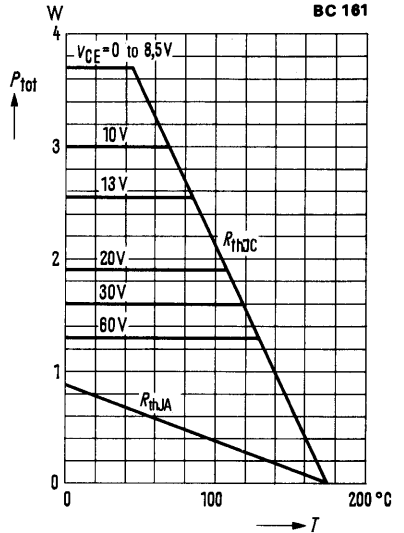
|           |      |    |
|-----------|------|----|
| $t_{on}$  | <500 | ns |
| $t_{off}$ | <650 | ns |

1) The transistor is overloaded to such an extent that the DC current gain decreases to  $h_{FE} = 20$

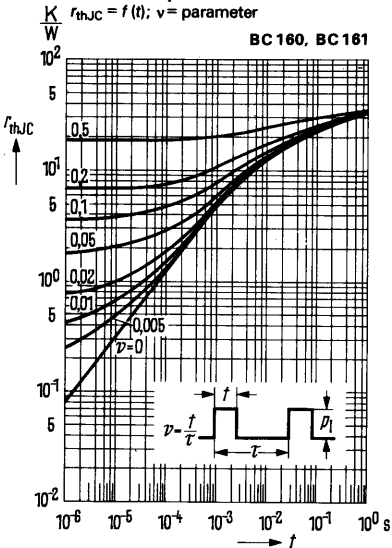
**Total power dissipation versus temperature**  
 $P_{tot} = f(T); R_{th} = \text{parameter}$



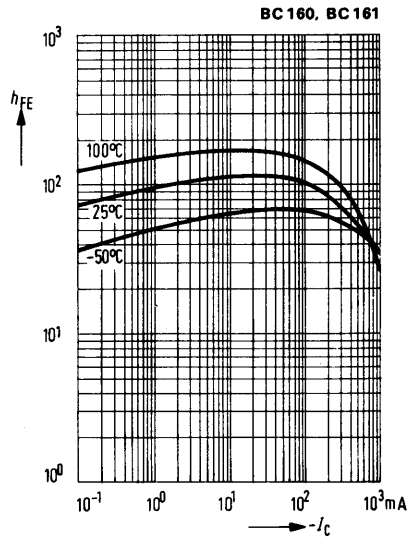
**Total power dissipation versus temperature**  
 $P_{tot} = f(T); R_{th} = \text{parameter}$



**Permissible pulse load**  
 $r_{thJC} = f(t); v = \text{parameter}$

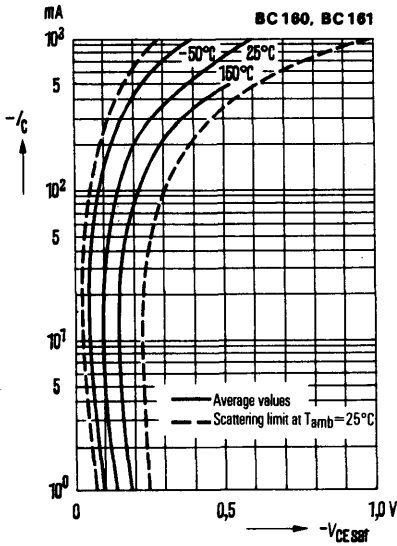


**DC current gain  $h_{FE} = f(I_C)$**   
 $-V_{CE} = 1V; T_{amb} = \text{parameter}$   
(common emitter configuration)



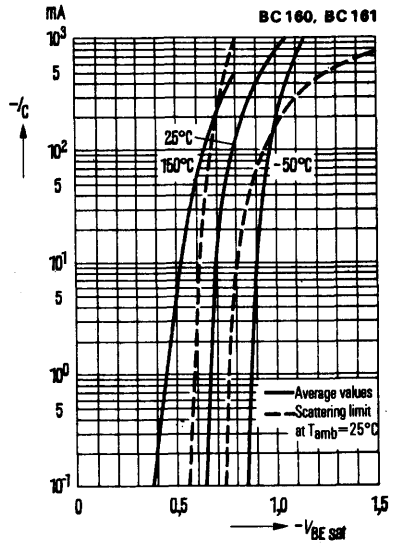
**Collector-emitter saturation voltage**

$V_{CEsat} = f(I_C)$   
 $h_{FE} = 10; T_{amb} = \text{parameter}$   
(common emitter configuration)



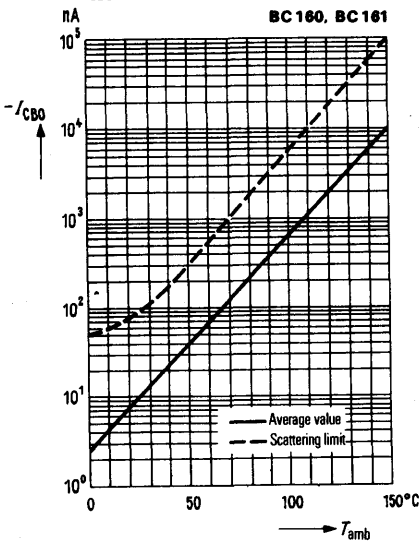
**Emitter-base saturation voltage**

$V_{BEsat} = f(I_C)$   
 $h_{FE} = 10; T_{amb} = \text{parameter}$   
(common emitter configuration)



**Collector cutoff current versus temperature**

$I_{CBO} = f(T_{amb}); -V_{CBO} = 60\text{ V}$



**Transition frequency  $f_T = f(I_C)$**   
( $-V_{CE} = 10\text{ V}$ )

